

AMENDMENTS TO THE CLAIMS

Pursuant to 37 CFR 1.121, presented below are the pending claims having status identifiers. Claims 1-14 and claims 22-30 (which were previously in a withdrawn status) are herewith canceled. Claims 15, 21 and 34 are herewith amended.

New claim 40 is presented in independent form, as it was formerly allowable dependent claim 16. Also, new claim 41 is presented in independent form, as it was formerly allowable dependent claim 38.

We claim:

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11. (Canceled)
12. (Canceled)
13. (Canceled)
14. (Canceled)

15. (Currently amended) A spindle motor comprising:

a journal bearing defined between an inner component and an outer component, wherein the inner component and the outer component are positioned for relative rotation, and define a portion of a stationary component and a rotatable component;

a fluid recirculation passageway including a first fluid passageway defined within the outer component, the first fluid passageway in fluid communication with a second fluid passageway, the second fluid passageway defined between the outer component and a radial member extending radially from the inner component, wherein the first fluid passageway and the second fluid passageway are in fluid communication with the journal bearing at separate locations;

a shield, connected to one of the stationary component and the rotatable component, defining a reservoir with the outer component, wherein the reservoir is a receptacle for fluid volume changes within the motor and for any air from the fluid, wherein the fluid enters and exits the reservoir at a recirculation plenum, and wherein a the recirculation plenum is defined by a junction joining the reservoir, the first fluid passageway and the second fluid passageway; and means for sealing the reservoir.

16. (Previously presented) The spindle motor as in claim 34, wherein:

means for creating the asymmetric pressure gradient, circulating fluid and purging air comprises spiral grooves defined on the radial member to generate pumping pressure to drive fluid recirculation and to pump fluid from the second fluid passageway toward the inner component and into the journal bearing, when the inner component and the outer component are in relative rotational motion; and

means for sealing the reservoir comprises at least one of a capillary seal defined between the shield and the outer component, and a grooved pumping seal formed by spiral grooves on the radial member adjacent to an outer diameter gap defined between the shield and an outer diameter of the radial member, the outer diameter gap joining the recirculation plenum junction.

17. (Original) The spindle motor as in claim 15, wherein the reservoir is structured to hold up to 2.5 mg. of fluid.

18. (Original) The spindle motor as in claim 15, further comprising axial channels on at least a portion of an inner surface of the shield substantially extending from the recirculation plenum and along the reservoir, to allow air within the fluid to move along the channels and be purged from the fluid, and to retain fluid.

19. (Original) The spindle motor as in claim 15, further comprising a fill-hole defined within the shield, wherein a meniscus is positioned between the fill-hole and the fluid in the reservoir, the fill hole making an angle with a surface of the shield.

20. (Original) The spindle motor as in claim 15, wherein the inner component is affixed to a base and to a top cover plate, wherein the outer component rotates relative to the inner component.

21. (Currently amended) The spindle motor as in claim 15, wherein an engagement interface of the radial member with a base ranges from ~~ranges from~~ 3 millimeters to 5 millimeters, for dynamic parallelism.

22. (Canceled)

23. (Canceled)

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30. (Canceled)

31. (Previously presented) The spindle motor as in claim 15, wherein the inner component comprises a shaft and the outer component comprises a sleeve.

32. (Previously presented) The spindle motor as in claim 15, wherein the first fluid passageway is defined through a sleeve.

33. (Previously presented) The spindle motor as in claim 15, wherein the radial member is a thrust plate and the second fluid passageway is defined between the thrustplate and the outer component.

34. (Currently amended) The spindle motor as in claim 15, further comprising means for creating an asymmetric pressure gradient within the fluid recirculation passageway, circulating fluid and purging air in the fluid, wherein the fluid circulates about a substantial portion of the journal bearing, the first fluid passageway, and the second fluid passageway.

35. (Previously presented) The spindle motor as in claim 15, wherein the shield and the outer component form adjacent surfaces, wherein the adjacent surfaces are relatively tapered, and wherein the relatively tapered adjacent surfaces converge toward the recirculation plenum.

36. (Previously presented) The spindle motor as in claim 15, wherein the shield is positioned for serving as a travel limiter to the outer component.

37. (Previously presented) The spindle motor as in claim 15, further comprising a symmetrical grooving pattern included on a portion of one of the inner component and the outer component comprising one of a herringbone pattern and a sinusoidal pattern for providing radial stiffness substantially focused at an apex of the grooving pattern.

38. (Previously presented) The spindle motor as in claim 15, further comprising an asymmetrical grooving pattern on an axial end of one of the inner component and the outer component, for providing radial stiffness substantially focused at an apex of the asymmetrical grooving pattern, and for generating pressure substantially equivalent to the pressure located at a journal plenum,

wherein the journal plenum is positioned between the asymmetric grooving pattern and the radial member and defined at a joining position of the first fluid passageway and the journal bearing.

39. (Previously presented) The spindle motor as in claim 15, further comprising a variable journal bearing gap for providing asymmetric journal bearing pressure distribution, wherein the variable journal bearing gap is radially wider substantially adjacent to a journal plenum as compared to the remainder of the journal bearing, wherein the journal plenum is defined at a joining position of the first fluid passageway and the journal bearing.

40. (New) A spindle motor comprising:

a journal bearing defined between an inner component and an outer component, wherein the inner component and the outer component are positioned for relative rotation, and define a portion of a stationary component and a rotatable component;

a fluid recirculation passageway including a first fluid passageway defined within the outer component, the first fluid passageway in fluid communication with a second fluid passageway, the second fluid passageway defined between the outer component and a radial member extending radially from the inner component, wherein the first fluid passageway and the second fluid passageway are in fluid communication with the journal bearing at separate locations;

a shield, connected to one of the stationary component and the rotatable component, defining a reservoir with the outer component, wherein a recirculation plenum is defined by a junction joining the reservoir, the first fluid passageway and the second fluid passageway;

means for creating an asymmetric pressure gradient within the fluid recirculation passageway, circulating fluid and purging air in the fluid, wherein the fluid circulates about a substantial portion of the journal bearing, the first fluid passageway, and the second fluid passageway, wherein means for creating the asymmetric pressure gradient, circulating fluid and purging air comprises spiral grooves defined on the radial member to generate pumping pressure to drive fluid recirculation and to pump fluid from the second fluid passageway toward the inner component and into the journal bearing, when the inner component and the outer component are in relative rotational motion; and

means for sealing the reservoir comprising at least one of a capillary seal defined between the shield and the outer component, and a grooved pumping seal formed by spiral grooves on the radial member adjacent to an outer diameter gap defined between the shield and an outer diameter of the radial member, the outer diameter gap joining the recirculation plenum junction.

41. (New) A spindle motor comprising:

a journal bearing defined between an inner component and an outer component, wherein the inner component and the outer component are positioned for relative rotation, and define a portion of a stationary component and a rotatable component;

a fluid recirculation passageway including a first fluid passageway defined within the outer component, the first fluid passageway in fluid communication with a second fluid passageway, the second fluid passageway defined between the outer component and a radial member extending radially from the inner component, wherein the first fluid passageway and the second fluid passageway are in fluid communication with the journal bearing at separate locations;

a shield, connected to one of the stationary component and the rotatable component, defining a reservoir with the outer component, wherein a recirculation plenum is defined by a junction joining the reservoir, the first fluid passageway and the second fluid passageway;

means for sealing the reservoir; and

an asymmetrical grooving pattern on an axial end of one of the inner component and the outer component, for providing radial stiffness substantially focused at an apex of the asymmetrical grooving pattern, and for generating pressure substantially equivalent to the pressure located at a journal plenum, wherein the journal plenum is positioned between the asymmetric grooving pattern and the radial member and defined at a joining position of the first fluid passageway and the journal bearing.